

TROPICAL STORM LEE (18W)

Tropical Storm Lee was the seventh of eight significant tropical cyclones to occur during September. Lee had a formative period of over four days, and was tracked over 1300 nm (2408 km) as an identifiable area of convection before the first warning was issued.

On 16 September Tropical Storms Irma (15W) and Jeff (16W) had just been finalled, Typhoon Hal (14W) was recurving east of Japan and a new area of persistent convection was mentioned on the Significant Tropical Weather Advisory at 160600Z. This persistent convection was tropical upper-tropospheric trough (TUTT) induced (Sadler, 1979) and was

superimposed on the broad low-level easterly flow. A steady westward movement was noted for the next four days, during which time there was little change in the poorly organized convection. At 200600Z the disturbance was upgraded to a "fair" suspect area due to improved organization. A Tropical Cyclone Formation Alert followed at 201730Z after the system continued to show improved organization and intensification to 30 kt (15 m/sec) sustained surface winds, based on a satellite analysis estimate. Another estimate of 35 kt (18 m/sec) sustained surface winds followed at 210000Z and prompted the first warning on Tropical Storm Lee (Figure 3-18-1). Lee

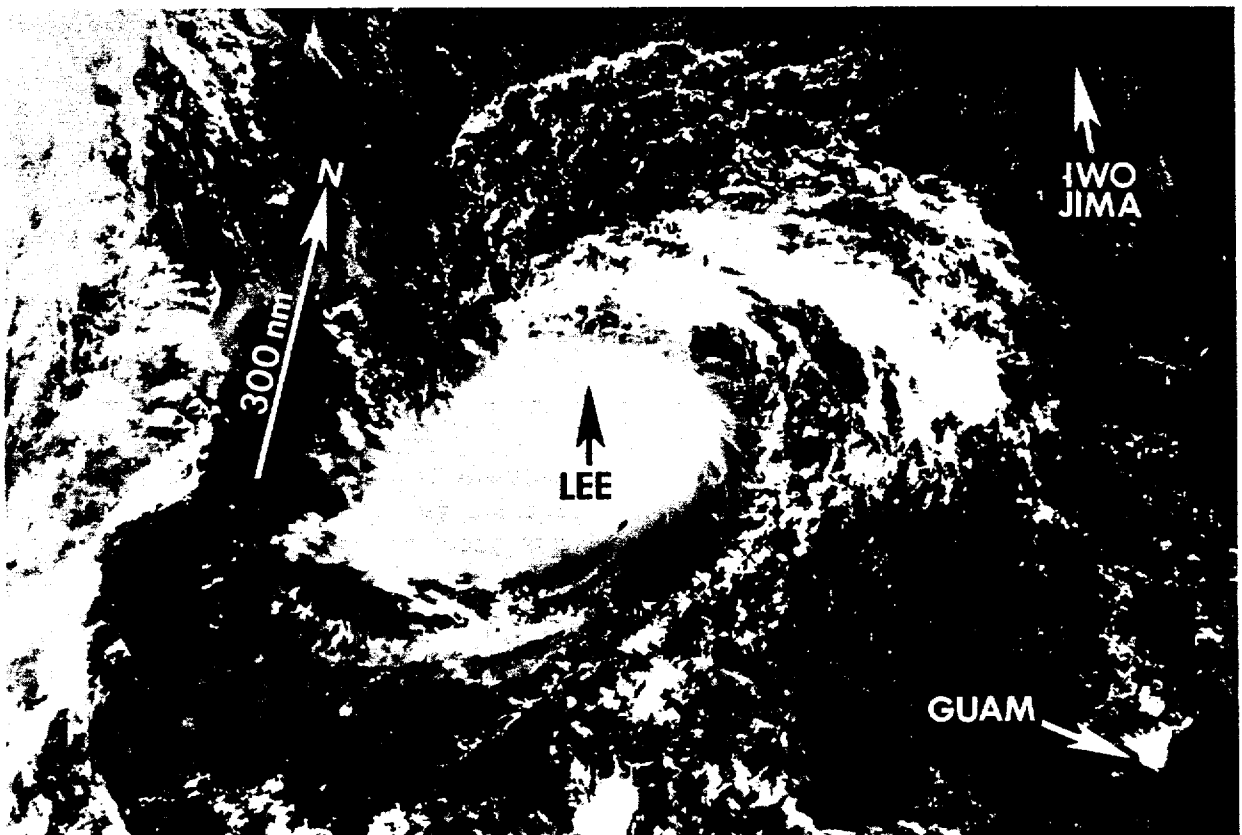


Figure 3-18-1. Tropical Storm Lee just after the first warning. Satellite intensity analysis indicated a T-number of 2.5, corresponding to sustained surface winds of 35 kt (18 m/sec) (210012Z September DMSP visual imagery).

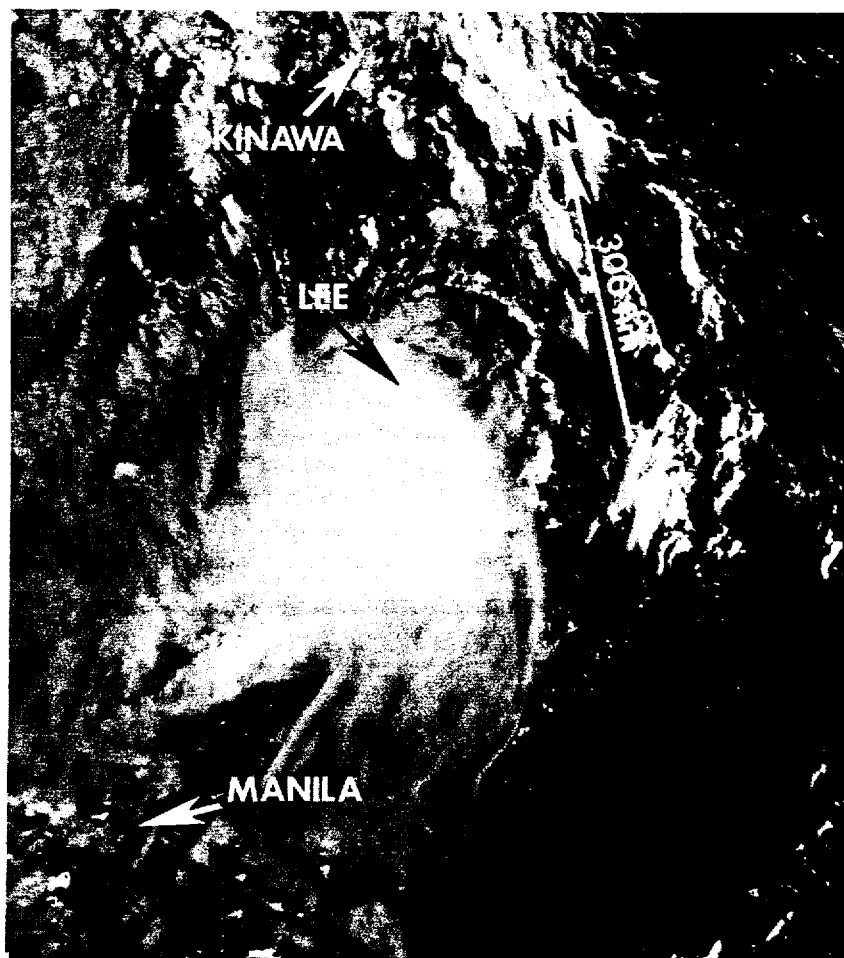


Figure 3-18-2. Shortly before recurvature, Lee shows the effects of increased vertical wind shear. The low-level circulation center is partially exposed to the northeast of the central dense overcast (232304Z September DMSP visual imagery).

tracked west-northwestward along the southwestern side of the subtropical ridge for the next 24-hours, and acquired its maximum intensity of 55 kt (28 m/sec) at 211800Z. The forecast was for Lee to continue on its northwestward track around the periphery of the 700 mb subtropical ridge.

Visual satellite imagery (Figure 3-18-2) on 23 September showed a partially exposed low-level circulation center, as Lee encountered increasing vertical wind shear. When night arrived, Lee's poorly defined deep convection provided targets for remote sensing — bright cold tops on the satellite infrared and rain echoes for the radar. Beginning at 231100Z, radar position reports from Ishigaki Jima (WMO 47918) confirmed the movement of the rain echoes to the northwest, which paralleled

Kit's (17W) earlier track into southeastern China. However, remarks the following morning on the relocated 240000Z warning summed it up: "Visual satellite pictures indicate Lee has an exposed low-level circulation that has been moving northeastward. Tropical Storm Lee has recurved earlier than expected and should now pass about 55 nm east of Okinawa."

This forecast was accurate and Lee's closest point of approach was 45 nm (83 km) southeast of the island of Okinawa at 240400Z. Lee started to lose its convective organization and showed signs of becoming extratropical at 240600Z. The final warning was issued at 241200Z. Lee became an extratropical low at 242100Z and continued moving rapidly northeastward.